AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, (33 U.S.C. §§1251 et seq.; the "CWA"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

Gardner Department of Public Works
City Hall
95 Pleasant Street
Gardner, Massachusetts 01440

is authorized to discharge from the facility located at

Gardner Wastewater Treatment Facility
52 Plant Road
East Templeton, Massachusetts 01438

to the receiving water named

Otter River (Segment MA 35-07)

in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein.

The Town of Ashburnham is a co-permittee for PART I.B. UNAUTHORIZED DISCHARGES and PART I.C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM which include conditions regarding the operation and maintenance of the collection system owned and operated by the Town. The responsible Town authority is:

Town of Ashburnham
15 Oakmont Dr.
Ashburnham, MA 01430

This permit will become effective on December 1, 2009.

This permit and the authorization to discharge expire at midnight of November 30, 2014.

This permit supersedes the permit issued on June 30, 2004.

This permit consists of Part I including effluent limitations and monitoring requirements, Part II including General Conditions and Definitions, Attachment A, the Freshwater Chronic Toxicity Test Procedure and Protocol, Attachment B, Reassessment of Technically Based Industrial Discharge Limits, Attachment C, Industrial Pretreatment Annual Report, Attachment D, Sludge Compliance Guidance, and Attachment E, Summary of Required Reports.

Signed this 30th day of September, 2009

/S/ SIGNATURE ON FILE

_____	_____
Director	Director
Office of Ecosystem Protection	Division of Watershed Management
Environmental Protection Agency	Department of Environmental Protection
Boston, MA	Commonwealth of Massachusetts
	Boston, MA

Part I. A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number **001**. Such discharges shall be limited and monitored by the permittee as specified below.

Effluent Characteristic	Units	Effluent Limitations			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[2]
Flow[1]	mgd	5.0	***	***	Continuous	Recorder
		Report	***	Report		
BOD[3] (April 1 – October 31)	mg/l	8.7	8.7	Report	2/week	24-hour composite[4]
	lbs/day	364	364	***		
BOD[3] (November 1 – March 31)	mg/l	26.2	39.3	Report	2/week	24-hour composite[4]
	lbs/day	1093	1640	***		
TSS[3] (April 1 – October 31)	mg/l	17.4	17.4	Report	2/week	24-hour composite[4]
	lbs/day	729	729	***		
TSS[3] (November 1 - March 31)	mg/l	26.2	39.3	Report	2/week	24-hour composite[4]
	lbs/day	1093	1640	***		
pH[5]	s.u.		6.5 – 8.3		1/day	grab
Dissolved Oxygen[5] (April 1 – October 31)			NOT LESS THAN 6.0 mg/l AT ANY TIME		1/day	grab
E. coli[5,6] (April 1 – October 31)	cfu/100ml	126	***	409	1/week	grab
Total Residual Chlorine[7,8] (April 1 – October 31)	ug/l	15	***	26	1/day	grab
Total Phosphorus[9] (April 1 – October 31)	mg/l	0.12	***	Report	2/week	24-hour composite[4]
	lbs/day	5.0	***	Report		
(November 1 – March 31)	mg/l	1.0	***	Report	1/week	24-hour composite[4]
	lbs/day	41.7	***	Report		

Effluent Characteristic	Units	Effluent Limitations			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[2]
Dissolved orthophosphate (November 1 –March 31)	mg/l	Report	***	***	1/week	24-hour composite[4]
Total Nitrogen[3,10]	mg/l	Report	***	Report	1/week	24-hour composite[4]
	lbs/day	Report	***	Report		
Total Kjeldahl Nitrogen[3]	mg/l	Report	***	Report	1/week	24-hour composite[4]
Total Ammonia Nitrogen[3]						
(June 1 – October 31)	mg/l	1.0	1.0	***	1/week	24-hour composite[4]
	lbs/day	Report	Report	***		
(November 1 – May 31)	mg/l	4.4	4.4	***	1/week	
	lbs/day	Report	Report	***		
Nitrate + Nitrite[3]	mg/l	Report	***	Report	1/week	24-hour composite[4]
Aluminum	ug/l	87	***	Report	1/month	24-hour composite[4]
Cadmium[11]	ug/l	0.5	***	Report	1/month	24-hour composite[4]
Copper[12]	ug/l	13.6	***	22.0	1/month	24-hour composite[4]
Lead[13]	ug/l	4.4	***	Report	1/month	24-hour composite[4]
Mercury[14]	ug/l	1.3	***	2.3	1/month	24-hour composite[4]
Whole Effluent Toxicity[15,16,17]	%	Acute LC50 ≥100% Chronic NOEC ≥ 72%			1/quarter	24-hour composite[4]

Footnotes:

1. The average monthly flow limit is an annual average limit which shall be reported as a rolling average. The DMR will report the average flow that is calculated from that month and the previous 11 months. In addition, report the average monthly flow and maximum daily flow for each month.

2. All sampling shall be representative of the influent and of the effluent discharged through outfall 001 to the Otter River. A routine sampling program shall be developed in which samples are taken at the same location, same time, and same days of every month. Any deviations from the routine sampling program shall be documented in correspondence appended to the applicable discharge monitoring report that is submitted to EPA. All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. All samples shall be 24-hour composites unless specified as a grab sample in 40 CFR §136.

3. Sampling required for influent and effluent.

4. 24-hour composite samples will consist of at least twenty-four (24) grab samples taken during a consecutive 24-hour period (e.g. 7:00 am Monday to 7:00 am Tuesday) and combined proportional to flow.

5. Required for State certification.

6. The average monthly limit for *E. coli* is expressed as geometric means. The samples for *E. coli* shall be taken at the same time as a sample for chlorine.

7. The minimum level (ML) for Total Residual Chlorine (TRC) is defined as 20 ug/l using EPA approved methods found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater, Method 4500 CL-E and G. One of these methods must be used to determine TRC. The ML is not the minimum level of detection, but rather the lowest point on the curve used to calibrate the test equipment for the pollutant of concern. If EPA approves a more sensitive method of analysis for TRC, the permit may be reopened to require the use of the new method with a corresponding lower ML. Sample results at or below the ML shall be reported as zero on the discharge monitoring report.

8. Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

9. See Part I.E, Special Conditions 1. for schedule of compliance and interim limit.

10. See Part I.E, Special Conditions 2. for additional nitrogen requirements.

11. The minimum level (ML) for cadmium is defined as 0.5 ug/l. An EPA-approved method in Part 136 with an equivalent or lower ML shall be used for effluent limitations less than 0.5 ug/l. Compliance/non-compliance will be determined based on the ML. Sampling results of 0.5 ug/l or less shall be reported as zero on the Discharge Monitoring Report.

12. The minimum level (ML) for copper is defined as 3 ug/l. An EPA-approved method in Part 136 with an equivalent or lower ML shall be used for effluent limitations less than 3 ug/l. Compliance/non-compliance will be determined based on the ML. Sampling results of 3 ug/l or less shall be reported as zero on the Discharge Monitoring Report.

13. The minimum level (ML) for lead is defined as 3 ug/l. An EPA-approved method in Part 136 with an equivalent or lower ML shall be used for effluent limitations less than 3 ug/l. Compliance/non-compliance will be determined based on the ML. Sampling results of 3 ug/l or less shall be reported as zero on the Discharge Monitoring Report.

14. The method detection limit for mercury (MDL; 40CFR136, Appendix B) has been determined to be 0.2 ug/l when no interferences are present. EPA method 1631, revision E: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry, August 2002 or other EPA approved method with an equivalent or lower MDL must be used.

15. The permittee shall conduct chronic (and modified acute) toxicity tests 4 times per year. The chronic test may be used to calculate the acute LC_{50} at the 48-hour exposure interval. The permittee shall test the daphnid, *Ceriodaphnia dubia*, and the fathead minnow, *Pimephales promelas.* Toxicity test samples shall be collected during the second week in the months of January, April, July, and October. The test results shall be submitted by February 28th, May 31st, August 31st, and November 30th, respectively. The tests must be performed in accordance with the Freshwater Chronic Toxicity Test Procedure and Protocol (Attachment A).

16. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment A (Toxicity Test Procedure and Protocol**) **Section IV., DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found in Attachment G of NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs) which is sent to all permittees with their annual set of DMRs and may also be found on the EPA, Region I web site at http://www.epa.gov/region1/enforcementandassistance/dmr.html. If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachment A**. Any modification or revocation to this guidance will be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

17. The LC_{50} is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent shall cause no more than a 50% mortality rate. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction at a specific time of observation as determined from hypothesis testing where the test results exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the permittee must report the lowest concentration where there is no observable effect. The "72% or greater" limit is defined as a sample which is composed of 72% (or greater) effluent, the remainder being dilution water.

I.A.1. (continued)

a. The discharge shall not cause a violation of the water quality standards of the receiving waters.

b. The pH limits of 6.5 to 8.3 s.u. will result in in-stream attainment of the water quality standards for Class B waters [314 CMR 4.05(3)(b)].

c. The discharge shall not cause objectionable discoloration of the receiving waters.

d. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time.

e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.

f. Sample results using EPA approved methods for any parameter above its required frequency must also be reported.

g. If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions.

2. All POTWs must provide adequate notice to the Director of the following:

a. Any new introduction of pollutants into that POTW from an indirect discharger in a primary industry category discharging process water; and/or

b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of the permit issuance.

c. For the purposes of this paragraph, adequate notice shall include information on:

(i) The quantity and quality of effluent introduced into the POTW; and

(ii) Any anticipated impact of the change on the quantity and quality of effluent to be discharged from the POTW.

3. Prohibitions Concerning Interference and Pass Through

Pollutants introduced into POTWs by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

4. Toxics Control

a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.

b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

5. Numerical Effluent Limitations for Toxicants

EPA or the MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants including, but not limited to, those pollutants listed in Appendix D of 40 CFR Part 122.

B. UNAUTHORIZED DISCHARGES

The permit only authorizes discharges in accordance with the terms and conditions of this permit and only from the outfall listed in PART 1 A.1. of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs) from any portion of the collection system are not authorized by this permit and shall be reported in accordance with Section D.1.e.(1) of the General Requirements of this permit (Twenty-four hour reporting). Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes DEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at: http://www.mass.gov/dep/water/approvals/surffms.htm#sso.

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions:

1. Maintenance Staff

The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit.

2. Preventative Maintenance Program

The permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges.

3. Infiltration/Inflow Control Plan

a. The permittee shall update its plan to control infiltration and inflow (I/I) to the separate sewer system. The plan shall be **submitted to EPA and MassDEP within six months of the effective date of this permi**t and shall describe the permittee's program for preventing I/I related effluent limit violations, and all unauthorized discharges of wastewater, including overflows and by-passes due to excessive infiltration/inflow.

The updated plan shall include:

- An ongoing program to identify and remove sources of I/I. The program shall include the necessary funding level and the source(s) of funding.
- An inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts. Priority should be given to the removal of public and private inflow sources that are upstream from, and potentially contribute to, known areas of sewer system backups and/or overflows.
- Identification and prioritization of areas that will provide increased aquifer recharge as the result of reduction/elimination of I/I to the system.
- An educational public outreach program for all aspects of I/I control, particularly private inflow.

b. Reporting Requirements

A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and the MassDEP annually, by the anniversary date of the effective date of this permit. This summary report shall, at a minimum, include:

- A map and description of inspection and maintenance activities conducted and corrective actions taken during the previous year.
- Expenditures for any I/I related maintenance activities and corrective actions taken during the previous year.

- A map with areas identified for I/I-related investigation/action during the coming year.

- A calculation of the annual average I/I and the maximum month I/I for the reporting year.

- A report of any I/I related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to B. UNAUTHORIZED DISCHARGES of this permit.

4. Alternative Power Source

   In order to maintain compliance with the terms and conditions of this permit, the permittee shall continue to provide an alternative power source with which to sufficiently operate its treatment works (as defined at 40 CFR §122.2).

D. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.

2. The permittee shall comply with the more stringent of either the state or federal (40 CFR Part 503), requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to facilities which perform one or more of the following uses or disposal practices.

   a. Land application – the use of sewage sludge to condition or fertilize the soil

   b. Surface disposal – the placement of sewage sludge in a sludge-only landfill

   c. Sewage sludge incineration in a sludge-only incinerator

4. The 40 CFR Part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions also do not apply to facilities which do not dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g. lagoons – reed beds) or are otherwise excluded under 40 CFR 503.6

5. The permittee shall use and comply with the sludge compliance guidance document to determine appropriate conditions. Appropriate conditions contain the following elements:

   - General requirements
   - Pollutant limitations
   - Operational standards (pathogen reduction requirements and vector attraction requirements)
   - Management practices

- Record keeping
- Monitoring
- Reporting

Depending upon the quality of the material produced by a facility, all conditions may not apply to the facility.

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction reduction at one of the following frequencies. The frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year.

Volume of dry sludge	Frequency
less than 290	1/year
290 to less than 1,500	1/quarter
1,500 to less than 15,000	6/year
Over 15,000	1/month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR 503.8.

8. The permittee shall **submit an annual report containing the information specified in the guidance by February 19**. Reports shall be submitted to the address contained in the reporting section of the permit. Sludge monitoring by the permittee is not required when the permittee is not the responsible for the ultimate sludge disposal. The permittee must be assured that any third party contractor is in compliance with appropriate regulatory requirements. In such case, the permittee is required only to submit an annual report by February 19 containing the following information:

    - Name and address of contractor responsible for sludge disposal
    - Quantity of sludge in dry metric tons removed from the facility by the sludge contractor

E. SPECIAL CONDITIONS

1. Total Phosphorus

    a. The permittee shall evaluate the ability of the existing treatment facilities to achieve the April1-October 31 monthly average total phosphorus limitation and shall submit a report by December 1, 2010 that summarizes the evaluation and includes a determination whether the existing facility is capable of reliably achieving the effluent limitations.

    b. If the permittee concludes that the existing facilities can achieve the April 1-October 31 monthly average limit, the limits will become effective in April 1, 2011.

c. If the permittee concludes that the exiting facilities cannot achieve the April 1-October 31 monthly average limit (and EPA and MassDEP concur), the limits will become effective April 1, 2013. Until the limit is achieved, the City shall submit an annual report, beginning on February 1, 2011, and each February 1 thereafter, describing progress towards attaining the effluent limitation, including a description of planning, design, and construction of any necessary facilities.

d. Until the April1-October 31 limit becomes effective, the permittee shall achieve a monthly average total phosphorus limit of 0.2 mg/l. Sampling for total phosphorus shall be conducted as required by the permit (i.e. the compliance schedule does not affect the monitoring requirements).

2. Total Nitrogen

By December 1, 2010 the permittee shall complete an evaluation of alternative methods of operating the existing wastewater treatment facility to optimize the removal of nitrogen, and submit a report to EPA and MassDEP documenting this evaluation and presenting a description of recommended operational changes. The methods to be evaluated include, but are not limited to, operational changes designed to enhance nitrification (seasonal and year round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. The permittee shall implement the recommended operational changes in order to maintain the existing mass discharge loading of total nitrogen. The annual average total nitrogen load from this facility (2004 – 2005) is calculated to be 450 lbs/day.

The permittee shall also submit an annual report to EPA and MassDEP, **by February 1 each year**, that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year.

F. PRETREATMENT

1. Limitations for Industrial Users:

The permittee shall develop and enforce specific effluent limits (local limits) for Industrial User(s), and all other users, as appropriate, which together with appropriate changes in the POTW's facilities or operation, are necessary to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. Within 120 days of the effective date of this permit, the permittee shall prepare and submit a written technical evaluation to the EPA analyzing the need to revise local limits. As part of this evaluation, the permittee shall assess how the POTW performs with respect to influent and effluent pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety, and collection system concerns. In preparing this evaluation, the permittee shall

complete and submit the attached form (**Attachment B**) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data, if available, and should be included in the report. Upon completion of its review, EPA will notify the POTW if the evaluation reveals that the local limits should be revised. Should the local limits need to be revised, the permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval. If local limits are to be updated, revisions should be performed in accordance with EPA's Local Limits Development Guidance (July, 2004).

2. Industrial Pretreatment Program

a. The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, procedures, and financial provisions described in the permittee's approved Pretreatment Program, and the General Pretreatment Regulations, 40 CFR 403. At a minimum, the permittee must perform the following duties to properly implement the Industrial Pretreatment Program (IPP):

1. Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP but in no case less than once per year and maintain adequate records.

2. Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a significant industrial user.

3. Obtain appropriate remedies for noncompliance by any industrial user with any pretreatment standard and/or requirement.

4. Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.

b. The permittee shall provide the EPA and the MassDEP with an annual report describing the permittee's pretreatment program activities for the twelve month period ending 60 days prior to the due date in accordance with 403.12(i). The annual report shall be consistent with the format described in **Attachment C** of this permit and shall be submitted no later than March 1 of each year.

c. The permittee must obtain approval from EPA prior to making any significant changes to the industrial pretreatment program in accordance with 40 CFR 403.18(c).

d. The permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 CFR 405 et. seq.

e. The permittee must modify its pretreatment program to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the industrial pretreatment program. The permittee must provide EPA, in writing, within 120 days of this permit's effective date proposed changes, if applicable, to the permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. The permittee will implement these proposed changes pending EPA Region I's approval under 40 CFR 403.18. This submission is separate and distinct from any local limits analysis submission described above.

f. On October 14, 2005 EPA published in the Federal Register final changes to the General Pretreatment Regulations. The final "Pretreatment Streamlining Rule" is designed to reduce the burden to industrial users and provide regulatory flexibility in technical and administrative requirements of industrial users and POTW's. Within 60 days of the effective date of this permit, the permittee must submit to EPA all required modifications of the Streamlining Rule in order to be consistent with the provisions of the newly promulgated Rule. To the extent that the POTW legal authority is not consistent with the required changes, they must be revised and submitted to EPA for review.

G. MONITORING AND REPORTING

A summary of reports required to be submitted under this NPDES permit is provided in **Attachment E**, **Summary of Required Reports**, as an aid to the permittee.

a. Monitoring results obtained during each calendar month shall be summarized and **reported on the Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the following month.**

b. Signed and dated originals of these, and all other reports required herein, shall be submitted to the Director and the State at the following addresses:

Environmental Protection Agency
Water Technical Unit (SEW)
P.O. Box 8127
Boston, MA 02114

c. Signed and dated Discharge Monitoring Report Forms and all other reports, excluding toxicity test reports, required by this permit shall be submitted to the State at:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection
Central Regional Office
627 Main Street
Worcester, MA 01608

d.. Signed and dated Discharge Monitoring Report Forms and toxicity test reports required by this permit shall also be submitted to the State at:

Massachusetts Department of Environmental Protection
Division of Watershed Management
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, MA 01608

e. Signed and dated pretreatment reports required in Section F. PRETREATMENT of this permit shall be submitted to:

Environmental Protection Agency
One Congress Street
Attn: Justin Pimpare
Suite 1100 - CMU
Boston, MA 02114-2023

and a copy to:

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention
Industrial Wastewater Program
One Winter Street
Boston, MA 02108

H. STATE PERMIT CONDITIONS

This discharge permit is issued jointly by the Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) under Federal and State law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MassDEP pursuant to M.G.L. Chap. 21 §43.

Each agency shall have the independent right to enforce the terms and conditions of this permit.

Any modification, suspension or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of this permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared invalid, illegal or otherwise issued in violation of State law such permit shall remain in full force and effect under Federal law as a NPDES permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of Federal law, this permit shall remain in full force and effect under State law as a permit issued by the Commonwealth of Massachusetts.

Attachment E
Gardner Wastewater Treatment Facility
Summary of Required Report Submittals

This Table is a summary of reports required to be submitted under this NPDES permit as an aid to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.

Required Report	Date Due	Submitted To: (see bottom of page for key)
Discharge Monitoring Report (DMR)	Monthly, postmarked by the 15th of the month following the monitoring month (e.g. the March DMR is due by April 15th.	1, 2, 3
Whole Effluent Toxicity (WET)Test Report (Part I.A.1)	February 28, May 31, August 31, and November 30 each year	1, 2, 3
Pretreatment Technical Evaluation (Part I.F.1.)	Within 120 days of permit effective date	1,2,4,5
Pretreatment Annual Report (Part I.F.2.b.)	March 1 each year	1,2,4,5
Streamlining Rule modifications (Part I.F.2.f.)	Within 60 days of permit effective date	1,2,4,5
I/I Control Plan (Part I.C.3)*	Within 6 months of permit effective date	1,2
I/I Annual Report (Part I.C.3)*	Anniversary of permit effective date	1,2
Annual Sludge Report (Part I.E.8.)	February 19 each year	1,2
Phosphorus Compliance Report (Part I. E.1.)	December 1, 2010 and	1,2
Nitrogen Optimization Evaluation Report (Part I.E.2.)	December 1, 2010	1,2
Nitrogen Optimization Annual Report (Part I.E.2.)	February 1 each year	1,2

*Also to be submitted by the Town of Ashburnham

1. EPA
   Water Technical Unit (SEW)
   P.O. Box 8127
   Boston, Massachusetts 02114

2. MassDEP
   Bureau of Resource Protection
   Central Regional Office
   627 Main Street
   Worcester, MA 01608

3. MassDEP
   Division of Watershed Management
   Surface Water Discharge Permit Program
   627 Main Street, 2nd Floor
   Worcester, Massachusetts 01608

4. EPA New England
   Attn: Justin Pimpare
   One Congress Street
   Suite 1100 – CMU
   Boston, MA 02114

5. MassDEP
   Bureau of Waste Prevention
   Industrial Wastewater Program
   One Winter Street
   Boston, MA 02108

RESPONSE TO COMMENTS

NPDES PERMIT No. MA0100994
City of Gardner, Massachusetts

On December 12, 2008, the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP) released a draft National Pollutant Discharge Elimination System (NPDES) permit for public notice and comment developed pursuant to an application from the City of Gardner, Massachusetts for the reissuance of its permit to discharge wastewater to the designated receiving water, the Otter River. The public comment period for this draft permit originally was to end on January 10, 2009 but was extended to January 24, 2009. Comments were received from Ms. Mary A. Colligan, Assistant Regional Administrator for Protected Resources, of the National Oceanic and Atmospheric Administration, Ms. Andrea F. Donlon, River Steward of the Connecticut River Watershed Council, in a letter dated January 23, 2009, and Mr. Dane E. Arnold, Director of the Gardner Department of Public Works, in an undated letter received prior to the close of the comment period.

After a review of the comments received, EPA has made a final decision to issue the permit authorizing this discharge. The following are the comments and EPA's response to those comments, including changes that have been made to the final permit from the draft as a result of the comments. The comment letters are part of the administrative record and are paraphrased herein. A copy of the final permit is available online at http://www.epa.gov/region1/npdes/permits_listing_ma.html or may be obtained by writing or by calling Mark Malone, EPA NPDES Permits Program (CMP), 1 Congress Street, Suite 1100, Boston, MA 02114-2023; telephone: (617) 918-1619.

Comments received from Ms. Mary A. Colligan, Assistant Regional Administrator for Protected Resources of the National Oceanic and Atmospheric Administration:

Comment A.1.

No species listed as threatened or endangered are known to occur in the vicinity of the project site. As such, no further coordination with NMFS PRD is necessary.

Response A.1.

The comment has been added to the public record.

Comments received from Ms. Andrea F. Donlon, River Steward of the Connecticut River Watershed Council

Comment B.1.

The effluent limitations table in the Draft Permit indicates a lower pH limit of 6.5 as discussed in the Fact Sheet. However, Part I.A.1.(b.) of the permit indicates a lower pH limit of 6.0.

Response B.1.

This discrepancy is noted and the lower pH limit in Pat I.A.1.b has been changed to 6.5 in the final permit.

Comment B.2.

We are glad the total phosphorus limit has been lowered and the monitoring frequency increased in the draft permit. But, given the very low dilution available in the river (which might be less because of the new public water supply) and the fact that this river segment is already impaired, we think there is justification for EPA to use the ecoregion criteria rather than the Gold Book for setting the permit limit.

Response B.2.

As discussed in the Fact Sheet, the effect of the public water supply well on the river cannot be determined at this time. Should information become available that demonstrates a reduction in the available dilution, the permit can be reopened and more stringent limitations established. In addition to the rationale given in the Fact Sheet for using the Gold Book criteria rather than the ecoregion criteria, the Gold Book criteria is applied to the 7Q10 flow whereas the ecoregion criteria, as well as other literature based criteria recommendations, are applied under seasonal average flows. Limits established to meet the Gold Book criteria under 7Q10 flow conditions are expected to result in receiving water concentrations within the range of ecoregion and other literature based seasonal criteria.

Comment B.3.

The Connecticut River Watershed Council supports the changes to include orthophosphate testing, more frequent nitrogen testing, more frequent metals testing, and the effluent limits for aluminum, copper, lead, and mercury.

Response B.3.

The comment has been added to the public record.

Comment B.4.

We are not sure of the justification for seasonal BOD and TSS limits since the Otter River is impaired for TSS and has very low dilution. The winter flows can also be low and we think the lower limit should be instituted year round to help mitigate the TSS impairments in the Otter River.

Response B.4.

The Fact Sheet noted that the current BOD and TSS limits have their origins in the maximum pollutant concentrations established in the report, *Millers River Basin Water Quality Management Plan – 1975*, by the Massachusetts Division of Water Pollution Control. EPA and MassDEP believe that because of the higher river flows, re-aeration rates, and DO saturation concentrations in the river during the winter, the winter limits in the permit are sufficient to ensure that the discharge does not cause or contribute to exceedances of water quality standards. The *Proposed Massachusetts Year 2008 Integrated List of Waters* lists this segment of the Otter River as impaired for turbidity (not DO or TSS), and a discharge achieving the TSS limits in the permit will not have excessive turbidity.. Consequently, the BOD and TSS limits established in the water quality management plan noted above are retained in the final permit.

Comments received from Mr. Dane Arnold, Superintendent of the Gardner Department of Public Works.

Comment C.1.

For the last seven years, the City of Gardner has been very proactive in recognizing the need to upgrade its wastewater treatment facility and to identify and remove Infiltration/Inflow from its collection system. In 2004, the City increased the sewer rates in five one-year steps to create enough revenue for the necessary improvements and created a hydraulic model of the sewer system and a map identifying capacity issues in the system. Also in 2004, the City began an extensive Sewer System Evaluation Study and the subsequent relining of over 36,000 l. f. of sewer at a cost of $1.2 million, which resulted in a 20% reduction in the average daily flows at the treatment facility. The City has already begun to analyze current and future flows, the existing condition of the plant and equipment, and what improvements may be necessary to meet future permit requirements. The Draft Permit requirements, however, will force our hands when we are not fiscally prepared and put our budget and sewer system needs in disarray. The City requests to not change any NPDES permit requirements at this time. However, the City will commit to upgrading the WWTF in the future to meet the proposed NPDES requirements. If a letter of understanding between the City and EPA is preferred or required, the City would be more than willing to negotiate such agreement.

Response C.1.

We commend the City for its voluntary efforts in addressing its long-term wastewater needs. However, NPDES permits must include limitations and condition sufficient to ensure that the discharge does not cause or contribute to exceedances of water quality standards. In this case, EPA and MassDEP determined that more stringent limitation and condition are necessary to ensure compliance with water quality standards. EPA understands that upgrades and improvement to the wastewater facilities will be needed to comply with the Permit. The Permit now includes a schedule of compliance for achieving the total phosphorus limit in the permit.(see the response to comment C.2 and Part I.E of the final permit). If the City believes that schedules of compliance are necessary for other permit conditions, it should contact EPA's Water Technical Unit or MassDEP, and discuss the issuance of an administrative compliance order that would include a reasonable schedule of compliance for achieving the new permit limitations.

Comment C.2.

The new draft permit lowers the phosphorus limit to 0.12 mg/l from April through October and 1.0 mg/l from November through March. The City has taken significant measures to reduce the discharge of phosphorus from 0.45 mg/l in 2004 to 0.13 mg/l in 2008. While the plant has occasionally met the new limit, it will not be able to consistently meet the 0.12 mg/l limit in its current configuration. Therefore, the City requests that the current phosphorus limits be maintained in the final permit.

Response C.2.

The April through October water quality-based limit for phosphorus was calculated using a basic mass balance equation (see page 102 of the *USEPA EPA NPDES Permit Writers Guide*). In that equation the limit was calculated to ensure that under 7Q10 flow conditions a receiving water total phosphorus concentration of 0.1 mg/l is attained. This equation accounts for the background (upstream) concentration of phosphorus in the receiving water The background concentration used in the phosphorus limit calculation represents the average of 12 samples collected in the summer of 1995 at the Route 2A bridge in Gardner (Station M01). EPA believes that this value is the best estimate of current background water quality that can be made using available information.

In its voluntary program to reduce the discharge of phosphorus, the City has demonstrated that it may be able to meet the more stringent phosphorus limits with its current facilities. In order to provide time for the City to assess this possibility, language has been added under **Part 1. E. SPECIAL CONDITIONS** that requiring the permittee to submit, by December 1, 2010, a report regarding the ability of the existing treatment facility to attain the new total phosphorus limit. If the permittee determines that it the existing facilities can achieve the new limits, those limits will become effective on April 1, 2011. If the permittee determines that the existing facility cannot meet the limit, the more stringent limits will become effective April 1, 2013 to allow for the planning, design, and construction of any necessary facilities.

At its discretion, the City could also perform sampling in the receiving water upstream of its discharge in order to provide additional information on the background concentration of phosphorus. If such sampling should provide new information that would support the calculation of an effluent limit different than the one in the final permit, EPA would consider this new information for the purpose of showing cause for a modification of the permit (see 40 CFR 122.62(a)(2). If the City decides to conduct such sampling, it should submit its proposed sampling program to EPA and MassDEP prior to initiation to ensure that appropriate QA/QC measures are followed.

Comment C.3.

While the current NPDES permit has a copper limit of 3.3 ug/l, an existing AO provides for an interim copper limit of 20 ug/l. The draft permit increased the copper limit in the permit to 13.3 ug/l, which is still well below the interim copper limit of 20 ug/l. While the City has seen a significant downward trend in the influent copper loading and the effluent copper discharge, it is

unlikely that it can comply with the new copper limit of 13.3 ug/l. The City requests that the new permit continue the 20 ug/l copper limit contained in the current AO.

Response C.3.

A NPDES permit cannot establish discharge limitations which will not result in the achievement of water quality standards of the receiving waterbody. Calculations as described in the Fact Sheet indicate that a limit of 13.3 ug/l is necessary to meet the existing in-stream water quality standard for copper. Therefore, a copper limit of 20 ug/l cannot presently be included in the NPDES permit and the limit of 13.3 ug/l is retained in the final permit. As discussed in the Fact Sheet, new State copper criteria based upon low ambient hardness have not yet been developed for the Millers River watershed. The permittee can petition the MassDEP to include that segment in its revised copper criteria in the next Water Quality Standards revision scheduled for 2009. While the City is currently operating under an AO with a copper limit of 20 ug/l, it is not presently clear what future actions might be taken regarding compliance with the copper limits in the City's permit. The City should contact EPA's Water Technical Unit or MassDEP to discuss the issuance of an administrative compliance order that would include a reasonable schedule of compliance for achieving the new permit limitations.

Comment C.4.

Monthly average numerical limits for aluminum (87 ug/l), cadmium (0.5 ug/l), lead (4.4 ug/l), and mercury (1.3 ug/l) have been added to the draft permit. While the City expects to meet those limits most of the time, the ability to meet these limits is as much a function of influent discharges as the plant's ability to remove them. The City, therefore, requests that the new permit maintain the current permit requirements for monthly reporting only for these metals.

Response C.4.

Discharge permit limitations are established so that the in-stream water quality standards of the receiving waterbody are met. Possible violation of the new metals limits mentioned above, or any permit limitation for that matter, is not a rationale for not including those numerical limits in the NPDES permit. The Final Permit therefore includes monthly average limits for aluminum, cadmium, lead, and mercury. As discussed in the response to comment C.1., if the City believes that a compliance schedule for achieving these limits is necessary, it should contact EPA's Water Technical Unit or MassDEP.

Comment C.5.

The new permit revises the trigger mechanism that will require the City to submit a report describing plans for maintaining compliance upon having an annual average flow equal to 80% of the design flow. This requirement in the current permit is contingent upon an effluent flow equal to 80% of the design flow for 90 consecutive days. The conditions of the new language in the draft permit are more restrictive and, in fact, would have been reached in 2005. However, those conditions have not been repeated since then. The City prefers the language in the current permit because it provides the City more flexibility as it addresses its I/I issues prior to requiring

the submittal of a formal report. As part of the City's ongoing effort to be proactive with regards to maintaining and optimizing its wastewater facilities, it has a draft Preliminary Flows and Loads study which would likely be suitable as meeting the requirement in question. However, the City would prefer that these reports and studies be completed under its own schedule, requirements, and planned funding rather than as a necessary component for permit compliance.

Response C.5.

The permit condition that requires the City to submit a report describing plans for maintaining compliance upon having an annual average flow equal to 80% of the design flow is the standard language being included in all reissued municipal NPDES permits, and is included to ensure that dischargers do not approach permitted flow limits, and possible capacity-related discharge violations, without planning. We applaud the City for achieving such a significant reduction in flow since 2005. The 20% flow reduction achieved through the City's I/I removal program is a much greater level of control than is typically achieved. Given this flow reduction, it appears that the City will not be required to submit a report pursuant to Part I.A.1.g in the near future. If the City does exceed the threshold for submittal of a report, it appears that the draft Preliminary Flows and Loads study may contain most of the necessary information. Consequently, the final permit retains the language of the draft permit.

Comment C.6.

The City objects to the new permit requirement for the nitrogen optimization evaluation report and the annual report summarizing activities related to optimal nitrogen efficiencies at the plant. The Fact Sheet indicates the justification for the requirements is the nitrogen-driven eutrophication impacts in Long Island Sound. The Long Island Sound TMDL includes a wasteload allocation for facilities discharging to the Connecticut River basin requiring a 25% reduction in the baseline total nitrogen loading estimated in the TMDL. However, there is no demonstration that a reduction in the total nitrogen loading from the Gardner facility which discharges to a tributary of a tributary of the Connecticut River will translate into the stated goal of reducing nitrogen-based eutrophication impacts in Long Island Sound. In addition the Fact Sheet indicates that the target 25% reduction is already being met. Therefore, no further nitrogen reduction is justified as a NPDES permit condition.

The City is assessing the capabilities of the plant with regards to nitrogen loadings and removal as part of its Preliminary Flows and Loads study. The City would prefer that any further studies, improvements, etc. be implemented as part of our proactive efforts to maintain and upgrade our treatment facilities and not as an unjustifiable requirement of the NPDES discharge permit.

Response C.6.

This condition is standard language for all municipal NPDES permit reissuances for facilities which contribute to Long Island Sound. Like phosphorus, nitrogen is transported in rivers and streams, subject to uptake, deposition, and release cycles and ultimately deposited in the oceans. While nitrogen may be retained in riverine systems or released to the atmosphere, some nitrogen discharged from the Gardner treatment facility will cause or contribute to the eutrophication in

Long Island Sound. Consequently, any reduction in the nitrogen loadings at the Gardner facility will reduce their impacts in Long Island Sound.

Regarding the nitrogen removal conditions in Part 1.F. of your permit, this requirement is to ensure that the nitrogen load discharged by your facility **does not increase** from the baseline loading of 450 pounds per day, estimated from the 2004-2005 data. The loading from the Gardner facility contributes to the aggregate loading at the MA/CT state line. As discussed in the fact sheet, this aggregate loading is currently achieving the wasteload in the Long Island Sound TMDL, and the optimization language is necessary to ensure that this aggregate loading does not increase.

It is expected that future updates to the Long Island Sound TMDL will most likely require significant reductions in the current nitrogen loads from wastewater treatment facilities in the Connecticut River Watershed. Consequently, the permit also requires that you investigate operational modifications and low capital cost improvements to further enhance nitrogen removal. This requirement will ensure that your WWTP will be able to be quickly brought into compliance should more stringent limits on the control of nitrogen be imposed in a modified or reissued permit. It also has the additional benefit of providing process control alternatives for maintaining the current mass loading should the flow to your WWTP increase.

The Final Permit retains the language of the draft permit.

Please note the following administrative change in the final permit.

The State is now requiring the immediate implementation of *E. coli* permit limits in the final permit in order to receive water quality certification rather than the one-year implementation schedule in the Draft Permit. Consequently, the permit limits for fecal coliform have been removed and the revisions to the *E. coli* permit limits can be found in the Effluent Limitations and Monitoring Requirements and the related Footnote 6.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND
1 CONGRESS STREET
SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

FACT SHEET

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO THE WATERS OF THE UNITED STATES.

NPDES NO: MA0100994

NAME AND ADDRESS OF APPLICANT:

Gardner Department of Public Works
City Hall
95 Pleasant Street
Gardner, Massachusetts 01440

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Gardner Wastewater Treatment Facility
52 Plant Road
East Templeton, Massachusetts 01438

NAME AND ADRESS OF CO-PERMITTEE:

The Town of Ashburnham is co-permittee for specific activities required by the permit, as set forth in Section VII. of this Fact Sheet and Parts I.B. and I.C. of the Draft Permit. The responsible municipal department is:

Board of Selectmen
15 Oakmont Dr.
Ashburnham, MA 01430

RECEIVING WATER: Otter River (Segment MA35-07)

CLASSIFICATION: B (Warm Water Fishery)

LATITUDE: 42° 34' 11" N **LONGITUDE:** 72° 1' 14" W

I. Proposed Action, Type of Facility, and Discharge Location

The above named applicant has requested that the U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection (MassDEP) reissue its NPDES permit to discharge into the designated receiving water, the Otter River. The location of the wastewater treatment facility is shown in Figure 1.

The Gardner Wastewater Treatment Facility (WWTF) is a 5.0 million gallon per day (MGD) advanced wastewater treatment plant. A site plan of the facility showing the unit processes is shown in Figure 2. The population served by the facilities is 20,000 in Gardner, 1,680 in Ashburnham, and 150 in East Templeton. Two significant industrial users (SIUs), one of which is also a categorical industrial user (CIU), discharge to the wastewater treatment works. See Section VI. for further information regarding industrial dischargers. The treatment facility also receives and treats septage from recreational vehicles only.

Approximately 30 miles of sewer serving Gardner, Ashburnham, and East Templeton collect and transport the domestic, commercial, and industrial wastewater for treatment. There is significant Infiltration/Inflow (I/I) in the collection system. The City is implementing its I/I plan, mainly through the relining of the problematic sewers.

Approximately 4,400 dry metric tons of sludge are generated annually and disposed of in a lined sludge-only landfill. The leachate from the landfill is collected and returned to the POTW headworks for treatment.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters based on recent monitoring data is shown in Attachment 1.

The facility has a history of noncompliance with its water quality-based copper limits. Administrative Orders issued in 2002 and 2005 established interim limits for copper and required the permittee to investigate the sources of copper and report on different strategies to reduce the copper in its effluent. The most recent Administrative Order (Docket No. 05-23) issued on September 28, 2005 established interim monthly average copper limits 0.83 lb/day and 20 ug/l while continuing to require annual reports on copper reduction efforts.

III. Permit Limitations and Conditions

The effluent limitations and monitoring requirements may be found in the draft NPDES permit.

IV. Permit Basis and Explanation of Effluent Limitation Derivation

The Clean Water Act (CWA or the Act) prohibits the discharge of pollutants to waters of the United States without an NPDES permit unless such a discharge is otherwise authorized by the

Act. An NPDES permit is used to implement technology-based and water quality-based effluent limitations and monitoring, reporting, and other requirements. This draft NPDES permit was developed in accordance with statutory and regulatory authorities established pursuant to the Act. The regulations governing the NPDES program are found in 40 CFR Parts 122, 124 and 125 and Part 133 for secondary treatment.

EPA is required to consider technology and water quality requirements when developing permit effluent limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 402 and 301(b) of the Act (see 40 CFR 125 Subpart A). Technology-based limitations for POTWs are based upon secondary treatment requirements found at 40 CFR Part 133.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards, 314 CMR 4.00, include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site specific criteria is established. The State will limit or prohibit discharges of pollutants to surface waters to assure that surface water quality standards of the receiving waters are protected and maintained.

The permit must also limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is, or may be, discharged at a level that caused, or has reasonable potential to cause, or contribute to, an excursion above any water quality criterion [40 CFR §122.44(d)(1)]. An excursion occurs if the projected or actual in-stream concentrations exceed the applicable criterion. In determining reasonable potential, EPA considers existing controls on point and non-point sources of pollution, variability of the pollutant in the effluent, sensitivity of the species to toxicity and, where appropriate, the dilution of the effluent in the receiving water.

Section 402(o) of the CWA provides, generally, that the effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the previous permit. Unless certain limited circumstances are met, "backsliding" from effluent limitations contained in previously issued permits that were based on CWA §§ 301(b)(1)(C) or 303 is prohibited. EPA has also promulgated anti-backsliding regulations, which are found at 40 CFR § 122.44(l). In accordance with regulations found at 40 CFR Section 131.12, MassDEP has developed and adopted a statewide antidegradation policy to maintain and protect existing in-stream water quality. The Massachusetts Antidegradation Provisions are found at Title 314 CMR 4.04. No lowering of water quality is allowed, except in accordance with the antidegradation provisions.

The limits in the draft permit are based on information in the application, the existing permit, discharge monitoring reports, and toxicity test results.

Waterbody Classification and Usage

The Otter River is classified as Class B, warm water fishery. The Massachusetts Surface Water Quality Standards (314 CMR 4.05(3)(b)) state that Class B waters shall have the following designated uses:

> *"These waters are designated as habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value."*

The 4.4 mile Otter River segment which receives the Gardner WWTF discharge flows from the Gardner WWTF to an impoundment located at the Seaman Paper Company Dam in Templeton. The *"Millers River Watershed 2002 Water Quality Assessment Report"* concludes that this segment is impaired for all uses due to mercury, PCBs, turbidity and phosphate. The *Proposed Massachusetts Year 2008 Integrated List of Waters* 303 (d) list identifies non-attainment due to nutrients, organic enrichment/low DO, and turbidity. From the Seaman Paper Dam, the Otter River flows another 5.5 miles to the confluence with the Millers River in Winchendon.

Past studies have revealed contamination in the drainage ditch that conveys the Gardner POTW discharge to the Otter River and in the downstream river sediment. These contaminants consist of elevated levels of metals including cadmium, chromium, copper, lead, mercury, nickel, and zinc. Polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and pesticides in levels above background concentrations were also found. A preliminary assessment indicated that the abandoned sludge drying beds as the onsite source of contaminants. The site was inspected by EPA in 2000 and subsequently reviewed by the MassDEP. In 2003, it was agreed that no further federal Superfund involvement is necessary and that the site be classified as a low priority/archive site in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and that the MassDEP be the lead agency for this site. The discharge was examined to determine if the above contaminants are present in an amount that would have the reasonable potential to cause or contribute to an exceedance of the water quality standards. The need for metals limits is discussed in the section, Metals, of this Fact Sheet. There is no indication that the other contaminants are present in the discharge in amounts that would require permit limitations. Unless new information becomes available, no further action at this site is anticipated.

Flow and Dilution Factor

The existing design average daily flow of the facility is 5.0 mgd (7.74 cfs). In determining certain permit limits, a dilution factor (DF) is calculated using the design flow of the treatment facility and the 7Q10 flow of the receiving water. Estimating 7Q10 flow at the point of discharge consists of retrieving 7Q10 flow data from a nearby gaging station and applying a ratio of the drainage area at the point of discharge to the drainage area at the gaging station. The 7Q10 flow (2.9 cfs) used for the

existing permit calculations is based upon the flow data from an upstream, partial record gaging station in Gardner at Route 2A (USGS station 01162900). This DF calculation is shown below.

7Q10 at USGS Station 01162900 = 2.7 cfs
Drainage Area = 19.2 mi^2
Drainage Area @ WWTF discharge = 20.8 mi^2
7Q10@ WWTF discharge = 20.8/19.2*2.7 = 2.9 cfs
Design flow = 5.0 mgd = 7.74 cfs

Dilution factor = (River 7Q10 @ Discharge + Design Flow) ÷ Design Flow
Dilution Factor = (2.9 + 7.74) ÷ 7.74 = 1.38

The current fact sheet also calculated a 7Q10 flow based upon flow data from the nearest long-term record gaging station near the Turner Street bridge (USGS 01163200) about 4 miles downstream of the Gardner WWTF. Using the data from a long-term gaging station is usually preferred when estimating 7Q10 flow at the point of discharge. The Gardner WWTF flow would be subtracted from that gaging station flow before calculating the drainage area ratio and the proportional low flow at the discharge. However, the City of Gardner withdraws up to 2.32 mgd (3.56 cfs) of water from Cowee Pond and Perley Brook located in the Otter River drainage area downstream of the WWTF discharge but upstream of the Turner Street bridge gaging station. Therefore, it is assumed that the WWTF discharge and the water supply withdrawals balance out each other and that the flow measured at the gaging station accurately reflects the true stream flow of the Otter River. A calculation using the long-term gaging station 7Q10 flow of 4.6 cfs and drainage area of 34.1 sq. mi. results in a 7Q10 flow at the WWTF discharge of 2.8 cfs compared to the flow of 2.9 cfs calculated above.

The City, subsequent to the current permit issuance, installed a public water supply well in the Snake Pond Road area upstream of the POTW discharge. As part of the MassDEP's permit for this well, the City is required to periodically monitor the Otter River surface elevations and compare the results to baseline stream elevations to determine the impact of the well upon the river. According to the MassDEP, the limited data collected so far is inconclusive regarding the impact of the well upon the flow in the Otter River.

The drainage areas and 7Q10 flows at the gaging stations have been confirmed and are still valid. Consequently, the DF of 1.38 is retained and will be used in this draft permit where appropriate.

BOD and TSS

The current BOD and TSS limits have their origins in maximum pollutant concentrations established in the report, *Millers River Basin Water Quality Management Plan – 1975*, by the Massachusetts Division of Water Pollution Control. Originally, the design flow of the Gardner WWTF was 3.8 mgd. The permit for the current 5.0 mgd design capacity maintained the mass loadings for BOD and TSS of the previous design flow of 4.37 mgd and, as a result, lowered the concentration limits. The following is an example calculation for BOD.

Average monthly concentration = average monthly mass loading/(des. flow *conversion factor)
= 364 lbs/day/(5.0 mgd * 8.34)
= 8.7 mg/l

Other mass limits are calculated similarly.

The eighty-five percent (85%) removal requirement for BOD and TSS is from the secondary treatment requirements of 40 CFR Part 133.

Fecal coliform, *E. coli* and pH

The limitations for pH and fecal coliform and *E. coli* are based upon water quality considerations and the Massachusetts state certification requirements under Section (401) (a) (1) of the Clean Water Act, as defined in 40 CFR §124.53.

An EPA letter dated December 17, 1992 allowed a change in the lower pH limit to 6.0, concluding that the limit would not violate water quality standards. That lower limit was maintained through subsequent permits and is in the current permit. However, according to the 2002 *Water Quality Assessment Report*, samples collected in 1995 in this segment at two stations (station M02 near the Route 101 bridge at the Gardner/Templeton border and station M03 near the Turner St. Bridge in Templeton) yielded pH measurements of 6.1, 6.4, 6.5, and 7.2 su. In 2000, another water quality sampling station located just upstream of Turner St. measured pH levels ranging from 5.8 to 6.1 su. Consequently, there is a reasonable potential that the discharge will cause or contribute to an exceedance of the minimum in-stream water quality standard of 6.5 s.u. under low flow conditions of the receiving water. Therefore, the draft permit establishes the lower pH limit at the in-stream criterion of 6.5 s.u.

The disinfection season of April through October recognizes that contact recreation, such as swimming, boating and fishing, occurs from the early spring through the autumn months. On December 29, 2006 the State approved Water Quality Standards which includes a revision to the bacteria criteria. Several scientific studies have demonstrated that *E. coli* is a better indicator than coliform of potential human health effects of bacteria from certain recreational uses, such as swimming. EPA approved this revision to the State water quality standards on September 19, 2007. Consequently, the draft permit contains *E .coli* limits that will become effective one year after the effective date of the permit. For the first year, there is a *report-only* requirement for *E. coli* as an adjustment period for the facility. The draft permit contains a fecal coliform limit as an interim limit during that first year, after which it will expire.

Total Residual Chlorine

Total Residual Chlorine (TRC) water quality criteria are established in the *Quality Criteria for Water 1986* (the Gold Book) and the subsequent 2002 update and have been adopted into the State Water Quality Standards. The in-stream criteria shall not exceed 11 ug/l for chronic toxicity and 19 ug/l for acute toxicity to protect aquatic life. Allowing for available dilution at the annual monthly average flow, the TRC permit limit calculations based on the dilution factor of 1.38 are shown below.

Average Monthly Chlorine Limit = 11 ug/l * 1.38 = 15ug/l
Daily Maximum Chlorine Limit = 19 ug/l * 1.38 = 26 ug/l

These limits are the same as those in the existing permit and are retained in the draft permit.

Phosphorus

Phosphorus interferes with water uses and reduces in-stream dissolved oxygen. State water quality standards (314 CMR 4.04(5) Control of Eutrophication) require any existing point source discharge containing nutrients in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practicable treatment to remove such nutrients. As discussed above, this segment of the Otter River appears on the Massachusetts 303(d) list for nutrients.

EPA has published national guidance documents which contain recommended total phosphorus criteria and other indicators of eutrophication. In order to control eutrophication, EPA's *Quality Criteria for Water 1986* (the Gold Book) recommends that in-stream phosphorus concentrations should be less than 100 ug/l (0.100 mg/l) in streams or other flowing waters not discharging directly to lakes or impoundments.

More recently, EPA released Ecoregional Nutrient Criteria, established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The published ecoregion-specific criteria represent conditions in waters minimally impacted by human activities, and thus representative of water without cultural eutrophication. The City of Gardner Wastewater Treatment Facility is within Ecoregion XIV, Eastern Coastal Plain, Northeastern Coastal Zone. Recommended criteria for this ecoregion is found in *Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV*, published in December, 2001, and includes a total phosphorus criteria of 23.75 ug/l (0.024 mg/l).

EPA has decided to apply the Gold Book criterion because it was developed from an effects-based approach versus the reference conditions-based approach used to develop the ecoregion criteria. The effects-based approach is taken because it is more directly associated with an impairment to a designated use (e.g. fishing). The effects-based approach provides a threshold value above which water quality impairments are likely to occur. It applies empirical observations of a causal variable (i.e. phosphorus) and a response variable (i.e. algal growth) associated with designated use impairments. Referenced-base values are statistically derived from a comparison within a population of rivers in the same ecoregional class. They are a quantitative set of river characteristics (physical, chemical, and biological) that represent minimally impacted conditions.

Sampling data from the 2000 Water Quality Assessment Report indicated a summer in-stream phosphorus concentration of 60 ug/l at Station M01 at the Route 2A bridge in Gardner. Using the Gold Book criteria and accounting for this in-stream concentration, a permit limit for phosphorus is calculated as follows:

$$\{(Q_R + Q_{WWTP}) * C_{WQ} - (Q_R * C_R)\} / Q_{WWTP} = C_{WWTP}$$

where:

Q_R = 7Q10 flow of the Otter River = 2.9 cfs
Q_{WWTP} = Design Flow of Gardner WWTP = 7.74 cfs
C_{WQ} = In-stream water quality criteria = 100 ug/l
C_R = In-stream phosphorus concentration = 60 ug/l
C_{WWTP} = Phosphorus concentration limit for Gardner WWTP

{(2.9 cfs + 7.74 cfs) * 100 ug/l) – (2.9 cfs *60) ug/l} / 7.74 cfs =
{1064 – 174} / 7.74 = 115 ug/l = 0.12 mg/l

Therefore the draft permit includes the 0.12 mg/l phosphorus limit for the algal growing season of April through October. The draft permit also increases phosphorus monitoring from once to twice per week because of the facility's large flow and low dilution factor.

Surface waters can also be affected by the year-round accumulation of phosphorus. The accumulated phosphorus can be released during warmer water temperatures and contribute to algal growth. Consequently, this draft permit establishes a 1.0 mg/l phosphorus limit for the period of November through March. It also includes a reporting requirement for dissolved orthophosphate for this period to confirm that the potential of phosphorus accumulation is minimized.

Nitrogen

Ammonia: The aforementioned *Millers River Basin Water Quality Management Plan – 1975* identified the need for ammonia nitrogen limits to address in-stream dissolved oxygen as the limiting concern in the summer and ammonia toxicity as the concern in the winter. That report determined that seasonal average monthly ammonia limits of 1.0 mg/l from June through September and 5.0 mg/l from October through May were appropriate. Similar to BOD and TSS, the ammonia limits needed to be re-examined as the design capacity of the treatment facility increased. The summer limit of 1.0 mg/l was determined to be sufficiently protective and was not revised. Maintaining the ammonia mass loading for the winter resulted in the current permit limits of 4.4 mg/l. These current values are more stringent than the limits (4.38 mg/l for the summer and 12.9 mg/l for the winter) calculated using the Gold Book criteria. The current permit ammonia limits are therefore retained.

Total Nitrogen: In December 2000, the Connecticut Department of Environmental Protection (CT DEP) completed a Total Maximum Daily Load (TMDL) for addressing nitrogen-driven eutrophication impacts in Long Island Sound. The TMDL included a Waste Load Allocation (WLA) for point sources and a Load Allocation (LA) for non-point sources. The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater facilities discharging to the Connecticut, Housatonic and Thames River watersheds) requires an aggregate 25% reduction from the baseline total nitrogen loading estimated in the TMDL.

The baseline total nitrogen point source loadings estimated for the Connecticut, Housatonic, and Thames River watersheds were 21,672 lbs/day, 3,286 lbs/day, and 1,253 lbs/day respectively (see table below). The estimated current point source total nitrogen loadings for the Connecticut, Housatonic, and Thames Rivers respectively are 13,836 lbs/day, 2,151 lbs/day, and 1,015 lbs/day. (Please note that EPA's current estimate of loadings to the Connecticut River is slightly greater than the estimates of the CT DEP, but is based on more recent information and includes all POTWs in the watershed). The following table summarizes the estimated baseline loadings, TMDL target loadings, and estimated current loadings:

Basin	Baseline Loading[1] lbs/day	TMDL Target[2] lbs/day	Current Loading[3] lbs/day
Connecticut River	21,672	16,254	13,836
Housatonic River	3,286	2,464	2,151
Thames River	1,253	939	1,015
Totals	26,211	19,657	17,002

1. Estimated loading from TMDL, (Appendix 3 to CT DEP "Report on Nitrogen Loads to Long Island Sound", April 1998)
2. Reduction of 25% from baseline loading
3. Estimated current loading from 2004 – 2005 DMR data – detailed summary attached as Exhibit A.

The TMDL target of a 25 percent aggregate reduction from baseline loadings is currently being met, and the overall loading from MA, NH and VT wastewater treatment plants discharging to the Connecticut River watershed has been reduced by about 36 percent.

In order to ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25 percent reduction over baseline loadings, EPA intends to include a permit condition for all existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic and Thames River watersheds, requiring the permittees to evaluate alternative methods of operating their treatment plants to optimize the removal of nitrogen, and to describe previous and ongoing optimization efforts. Facilities not currently engaged in optimization efforts will also be required to implement optimization measures sufficient to ensure that their nitrogen loads do not increase, and that the aggregate 25 % reduction is maintained. Such a requirement has been included in this permit.

Specifically, the permit requires an evaluation of alternative methods of operating the existing wastewater treatment facility in order to control total nitrogen levels, including, but not limited to, operational changes designed to enhance nitrification (seasonal and year round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. This evaluation is required to be completed and submitted to EPA and MassDEP within one year of the effective date of the permit, along with a description of past and ongoing optimization efforts. The permit also requires implementation of optimization methods sufficient to ensure that there is no increase in total nitrogen compared to the existing average daily load. The annual average total nitrogen load from this facility (2004 – 2005) is calculated to be 450 lbs/day. The permit requires annual reports to be submitted that summarize progress and activities related to

optimizing nitrogen removal efficiencies, document the annual nitrogen discharge load from the facility, and track trends relative to previous years. To better monitor the nitrogen removal in this optimization effort, the total nitrogen monitoring has been increased to once per week.

The agencies will annually update the estimate of all out-of-basin total nitrogen loads and may incorporate total nitrogen limits in future permit modifications or reissuances as may be necessary to address increases in discharge loads, a revised TMDL, or other new information that may warrant the incorporation of numeric permit limits. There have been significant efforts by the New England Interstate Water Pollution Control Commission (NEIWPCC) work group and others since completion of the 2000 TMDL, which are anticipated to result in revised wasteload allocations for in-basin and out-of-basin facilities. Although not a permit requirement, it is strongly recommended that any facilities planning that might be conducted for this facility should consider alternatives for further enhancing nitrogen reduction.

Metals

Relatively low concentrations of trace metals in receiving waters can be toxic to resident aquatic life species. EPA is required to limit any pollutant that is, or may be discharged at a level that caused, or has reasonable potential to cause, or contributes to an excursion above any water quality criterion. See 40 CFR 122.44(d)(1)(vi). Effluent metals data submitted with toxicity tests results and discharge monitoring reports were reviewed to determine if any of the metals in the discharge have the potential to exceed aquatic life criteria in the Otter River.

The criteria for cadmium, chromium III, copper, lead, nickel, silver, and zinc are hardness dependent; that is, as the concentration of $CaCO_3$ in water increases, the less stringent the criteria for these metals become. EPA's Office of Water - Office of Science and Technology stated in a letter dated July 7, 2000 that: *The hardness of the water containing the discharged toxic metal should be used for determining the applicable criterion. Thus, the downstream hardness should be used.* The hardness of the Otter River downstream of the plant was calculated as shown below. The average ambient and effluent hardness data from the whole effluent toxicity tests for the period of January, 2007 to January, 2008 is used in the calculation.

$$\{(Q_{WWTP} * C_{WWTP}) + (Q_R * C_R)\} / (Q_{WWTP} + Q_R) = C$$

where:

Q_{WWTP} = Design Flow of Gardner WWTP = 7.74 cfs
C_{WWTP} = $CaCO_3$ concentration for Gardner WWTP = 168 mg/l
Q_R = 7Q10 flow of the Otter River = 2.9 cfs
C_R = In-stream $CaCO_3$ concentration = 23 mg/l
C = Combined CaCO3 concentration

$\{(7.74 * 168) + (2.9 * 23)\} / (7.74 + 2.9)$ cfs = C
$\{1300.3 + 66.7\} / 10.6 = 129$ mg/l $CaCO_3$

The EPA recommended approach to set and measure compliance with water quality standards is to use dissolved metals, because dissolved metals more closely approximates the bioavailable fraction of metal in the water column than does total recoverable metal. Most toxicity to aquatic organisms is by adsorption or uptake across the gills which would require the metal to be in dissolved form. When toxicity tests were originally conducted to develop EPA's Section 304(a) metals criteria, the concentrations were expressed as total metals. Subsequent testing determined the percent of the total metals that is dissolved in the water column. The calculations that follow use the freshwater conversion factors to calculate the dissolved acute and chronic water quality criteria for metals (EPA National Recommended Water Quality Criteria:2002, Appendix A).

However, the regulations in 40 CFR 122.45(c) require that the permit limits be based on total recoverable metals. The chemical differences between the effluent and the receiving water may cause changes in the partitioning between dissolved and particulate forms of metals. As the effluent mixes with the receiving water, adsorbed metals from the discharge may dissolve in the water column. In this case, measuring dissolved metals would underestimate the impact on the receiving water, and an additional calculation, using a site-specific translator would determine total metal criteria. Based on EPA's Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion (EPA-823-B-96-007), the conversion factor is equivalent to the translator if site-specific studies for partitioning have not been conducted. The total recoverable effluent limit has been determined by dividing the dissolved criteria by the conversion factor in lieu of a translator.

The following example shows the calculation of the dissolved and total recoverable cadmium criteria. Cadmium is a hardness-based criteria and the correction factor for converting from total recoverable to dissolved metals is also hardness-based. The necessary equations and factors are found in National Recommended Water Quality Criteria: 2002. The equation for calculating the criteria is found in Footnote E, the conversion factors for dissolved metals are found in Appendix A, and the parameters for calculating freshwater dissolved metals criteria that are hardness-dependent are found in Appendix B. The calculations are shown below.

Chronic criteria (dissolved) = $\exp\{m_c[\ln(\text{hardness})] + b_c\}CF)$

Where: $m_c = 0.7409$
hardness = 129 mg/l
$b_c = -4.719$
CF = 1.101672-[(ln hardness)(0.041838)] = 0.898347

$= \exp\{0.7409[\ln(129)] -4.719\}0.898347)$
$= 0.29$ ug/l

Acute criteria (dissolved) = $\exp\{m_a[\ln(\text{hardness})] + b_a\}CF)$

Where: $m_a = 1.0166$
hardness = 129 mg/l
$b_a = -3.924$
CF = 1.136672-[(ln hardness)(0.041838)] = 0.933395

= exp{1.0166[ln(129)] -3.924}0.933395)

Acute criteria (dissolved) = 2.58 ug/l

As discussed above, in the absence of a site-specific translator, the correction factors found in Appendix A of National Recommended Water Quality Criteria: 2002 are used to convert from dissolved to total recoverable metals. Accordingly, the cadmium criteria expressed in total recoverable metals are as follows:

Chronic criteria (total recoverable) = Chronic Criteria (dissolved) ÷ CF
= 0.29 ug/l ÷ 0.898347
= 0.33 ug/l

Acute criteria (total recoverable) = Acute Criteria (dissolved) ÷ CF
= 2.58 ug/l ÷ 0.933395
= 2.76 ug/l

These criteria are then applied to the combined river flow and discharge flow and, accounting for in-stream concentrations of the metal, a limit for the treatment facility discharge is calculated as shown below. The chemical analyses performed on the receiving stream during WET testing provided the data on the background metals concentrations. Where no information is available, a zero background concentration is assumed. There is no available data for cadmium, chromium, and mercury background concentrations. The example below uses the chronic criteria and calculates a monthly average permit limit for cadmium.

$$\{(Q_R + Q_{WWTP}) * C_{WQ} - (Q_R * C_R)\} / Q_{WWTP} = C_{WWTP}$$

where:

Q_R = 7Q10 flow of the Otter River = 2.9 cfs
Q_{WWTP} = Design Flow of Gardner WWTP = 7.74 cfs
C_{WQC} = Chronic in-stream water quality criteria = 0.33 ug/l
C_R = Background cadmium concentration = 0 ug/l
C_{WWTPC} = Chronic cadmium concentration limit for Gardner WWTP

{((2.9 cfs + 7.74 cfs) * 0.33 ug/l) – (2.9 cfs *0) ug/l} / 7.74 cfs =
{10.64 – 0} / 7.74 = 0.45 ug/l

The maximum daily limit based upon the acute criteria is calculated in a similar manner.

Chronic and acute criteria and permit limitations derived in the same manner for the metals identified in the Otter River Sediment study are in the table below.

	In-stream Concentration ug/l	Total Recoverable Criteria Mon. Ave. ug/l	Total Recoverable Criteria Max. Daily ug/l	Calculated Permit Limitations Mon. Ave. ug/l	Calculated Permit Limitations Max. Daily ug/l
Aluminum	192	87.0	750.0	47.7	959.0
Cadmium	0	0.33	2.76	0.5	3.8
Chromium III	0	106.2	2221.2	145.9	3053
Chromium VI	0	11.43	16.29	15.7	22.4
Copper	6.5	11.60	17.8	13.6	22.0
Lead	4.5	4.4	112.9	4.4	153.5
Mercury	0	0.91	1.65	1.3	2.3
Nickel	0.007	64.7	582.0	88.9	800.0
Zinc	22	148.7	148.7	196.1	196.1

These limits are compared to sampling results reported in Discharge Monitoring Reports, expanded effluent testing submitted with the NPDES permit application, and chemical analyses performed in WET testing where available.

Aluminum. 18 sampling results from recent DMRs and WET tests averaged a concentration of 57 ug/l and a maximum concentration of 300 ug/l. These results indicate that there is a reasonable potential to cause or contribute to an exceedance of the average monthly water quality criteria. Because the calculated monthly average limit is less than the applicable criteron, the limit is set at the criteria. A discharge concentration equal to the criterion cannot cause or contribute to an exceedance of the criterion. Therefore, the draft permit contains a current monthly average limit of 87 ug/l, the in-stream aluminum criteria, and a report-only requirement for the maximum daily value.

Cadmium. WET tests yielded non-detectable results but used a method with a Minimum Level (ML) of 5 ug/l. Using a more sensitive test method with an ML of 0.5 ug/l, the expanded effluent test data yielded results of 0.0 ug/l, 0.6 ug/l and 0.9 ug/l, an average of 0.5 ug/l. The average concentration from these more sensitive tests is greater than the calculated cadmium monthly average limit indicating the reasonable potential for the discharge to cause or contribute to an exceedance of the chronic criterion.. There appears to be no reasonable potential to exceed the maximum daily limit of 3.8 ug/l. Therefore, the draft permit includes a monthly average limit of 0.5 ug/l and a report only requirement for the maximum daily concentration.

Chromium. Out of 9 samples taken, only 1 test resulted in a detectable amount of Total Chromium, 1.1 ug/l. Total Chromium contains both Chromium III and Chromium VI. Since there is no potential to exceed the water quality criteria, no permit limits are necessary for either Chromium III or Chromium VI.

Copper. Site specific copper criteria have been recently developed by the State and approved by EPA for certain waterbodies, but this segment of the Otter River is not one of those waterbodies. Consequently, the criteria developed above in accordance with the *National Recommended Water Quality Criteria 2002* methodology is used in the development of the permit copper limits. The current permit copper limits of 3.3 ug/l monthly average and 4.3 ug/l maximum daily did not

consider the combined hardness downstream of the discharge or the in-stream copper concentration of the receiving water. The draft permit limits have been recalculated for those conditions as discussed above. Consequently, the draft permit includes the calculated monthly average limit of 13.6 ug/l and maximum daily limit of 22.0 ug/l.

The relaxation of the copper limits is consistent with anti-backsliding. Section 402(o)(2) of the CWA lists "new information" as an exception to the general anti-backsliding prohibition, and the estimates of hardness downstream of the discharge, used in the calculation of the less stringent limits are "new information " pursuant to the listed exception. The calculated limits will achieve water quality and are also consistent with anitdegradation requirements because the limits are as or more stringent than the demonstrated performance of the treatment facility (see copper data in Attachment 1).

Lead. The DMR data indicated an average monthly concentration of 5 ug/l and a maximum concentration of 15 ug/l. There is a reasonable potential to exceed the chronic water quality criteria but not the acute criteria. Therefore, the draft permit includes a lead monthly average limit of 4.4 ug/l and a report only requirement for the maximum daily concentration.

Mercury. An examination of the DMR data indicated effluent concentrations of mercury greater than the calculated limits. Therefore, the draft permit has a monthly average limit of 1.3 ug/l and a maximum daily limit of 2.3 ug/l for mercury.

Nickel. The expanded effluent tests and WET tests indicated an average nickel concentration of about 6 ug/l and a maximum of 7.6 ug/l. These values are far less than the calculated limits, indicating that no nickel limits are necessary.

Zinc. The expanded effluent tests and WET tests resulted in an average concentration of 25 ug/l and a maximum of 50 ug/l. Compared to the calculated limits above, there is no reasonable potential to exceed the water quality criteria. Therefore, the draft permit does not include any limits for zinc.

Whole Effluent Toxicity

The MA Surface Water Quality Standards require that EPA criteria established pursuant to Section 304(a)(1) of the Clean Water Act be used as guidance in the interpretation of the following narrative criteria:

> *"All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife."*

National studies conducted by the Environmental Protection Agency have demonstrated that domestic sources contribute toxic constituents to WWTPs. These constituents include metals, chlorinated solvents and aromatic hydrocarbons among others. The impact of the toxicity of several constituents in a single effluent is measured through whole effluent toxicity (WET) testing.

Based on the potential for toxicity and in accordance with EPA regulation and policy, the draft permit includes acute toxicity limitations and monitoring requirements. (See, e.g., "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 50 Fed. Reg. 30,784 (July 24, 1985); see also, EPA's Technical Support Document for Water Quality-Based Toxics Control).

The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analyses; (2) bioavailability of pollutants after discharge is best measured by toxicity testing including any synergistic effects of pollutants; and (3) pollutants for which there are inadequate chemical analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in conjunction with pollutant specific control procedures to control the discharge of toxic pollutants.

The frequency and type of WET tests depend on the dilution factor and risk factor. Pursuant to EPA Region 1 policy, and MassDEP's Implementation Policy for the Control of Toxic Pollutants in Surface Waters, discharges having a dilution ratio less than 10:1 require acute toxicity testing and chronic testing, four times per year. The acute limit is an $LC_{50} \geq 100\%$ and the chronic limit is a C-NOEC $\geq$ 72%, which is the inverse of the dilution factor (1/1.38 = 72%). Both the daphnid, *Ceriodaohnia dubia*, and the fathead minnow, *Pimephales promelas*, shall be tested.

V. Sludge

Section 405(d) of the CWA requires that EPA develop technical regulations regarding the use and disposal of sewage sludge and that sludge conditions implementing these regulations are included in all POTW permits. The pertinent regulations are found at 40 CFR Part 503 and apply to any facility engaged in the treatment of domestic sewage.

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, a copy of the self-implementing *Sludge Compliance Guidance* document is being sent to the permittee with the Draft Permit for use by the permittee in determining the appropriate sludge conditions for its chosen method of sludge disposal.

VI. Pretreatment Program

There are 2 Significant Industrial Users (SIUs), one of which is a Categorical Industrial User (CIU), discharging to the Gardner WWTF. These dischargers are listed below.

Name	Industry	Process Wastewater	Non-process Wastewater
H&R 1871 LLC	Metal Finishing	4,000 gpd	2,000 gpd
City of Gardner	Sanitary Landfill	0	3,196

The permittee is required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR Part 403 and section 307 of the Act. The permittee's

pretreatment program received EPA approval on July 22, 1985. As a result, appropriate pretreatment program requirements were incorporated into the previous permits which were consistent with that approval and federal pretreatment regulations in effect when the permits were issued.

The Federal Pretreatment Regulations in 40 CFR Part 403 were amended in October 1988, and again in July 1990. Those amendments established new requirements for implementation of pretreatment programs. Upon reissuance of this NPDES permit, the permittee is obligated to modify its pretreatment program to be consistent with current Federal Regulations. Those activities that the permittee must address include, but are not limited to, the following: (1) develop and enforce EPA approved specific effluent limits (technically-based local limits); (2) revise the local sewer-use ordinance or regulation, as appropriate, to be consistent with Federal Regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users.

These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices.

In addition to the requirements described above, the draft permit requires the permittee to submit to EPA in writing, within 120 days of the permit's effective date, a description of proposed changes to permittee's pretreatment program deemed necessary to assure conformity with current federal pretreatment regulations. These requirements are included in the draft permit to ensure that the pretreatment program is consistent and up-to-date with all pretreatment requirements in effect. Lastly, the permittee must continue to submit, annually on March 1, a pretreatment report detailing the activities of the program for the twelve month period ending 60 days prior to the due date.

The permit requires the permittee to submit to EPA, within 60 days of the permit's effective date, all required modifications of the Streamlining Rule in order to be consistent with the provisions of the newly promulgated Rule. To the extent the permittee's legal authority is not consistent with the required changes, they must be revised and submitted to EPA for review.

VII. Operation and Maintenance

Regulations regarding proper operation and maintenance are found at 40 CFR § 122.41(e). These regulations require "that the permittee shall at all times operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit." The treatment plant and collection system are included in the definition "facilities and systems of treatment and control" and are therefore subject to proper operation and maintenance requirements.

Similarly, permittees have a 'duty to mitigate' as stated in 40 CFR §122.41 (d). This requires the permittees to "take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment."

General requirements for proper operation and maintenance, and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Part I.B., I.C. and I.D. of the draft permit. These requirements include reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration to the extent necessary to prevent SSOs and I/I related effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary.

Because the Town of Ashburnham owns and operates a collection system that discharges to the Gardner treatment works, the Town has been included as co-permittee for the specific permit requirements discussed in the paragraph above.

VIII. Endangered Species Act (ESA)

Under Section 7 of the Endangered Species Act, federal agencies are required to ensure that any action they conduct, authorize, or fund is not likely to jeopardize the continued existence of a federally listed species, or result in the adverse modification of critical habitat. The City of Gardner is located in Worcester County. The US Fish and Wildlife website (http://www.fws.gov/northeast/endangered/) lists only the terrestial plant, the small whorled pogonia, *Isotoria medeoloides*, as threatened in Worcester County.

EPA believes the authorized discharge from this facility is not likely to adversely affect any federally-listed species, or their habitats for the following reasons:

- The permit will prohibit violations of the state water quality standards.
- This is a re-issuance of an existing permit

EPA is seeking concurrence with this opinion from USFWS through the informal ESA consultation process.

IX. NMF Essential Fish Habitat

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with the National Marine Fisheries Services (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, may adversely impact any essential fish habitat as: waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity (16 U.S.C. § 1802 (10)). Adversely impact means any impact which reduces the quality and/or quantity of EFH (50 C.F.R. § 600.910 (a)). Adverse impacts may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habit-wide impacts, including individual, cumulative, or synergistic consequences of actions. Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 18555(b) (1) (A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

The Otter River is not covered by the EFH designation for riverine systems and thus EPA has

determined that a formal EFH consultation with NMFS is not required.

X. State Certification Requirements

EPA may not issue a permit unless the Massachusetts Department of Environmental Protection (MassDEP) certifies that the effluent limitations included in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The MassDEP has reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State pursuant to 40 CFR §124.53 and expects the draft permit will be certified.

XI. Comment Period and Procedures the Final Decision

All persons, including applicants, who believe any condition of the permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to the EPA and MassDEP contacts listed below. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues to be raised in the hearing. A public hearing may be held after at least thirty (30) days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after the public hearing, if held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and to each person who has submitted written comments or requested notice.

XI. EPA and MassDEP Contacts

Additional information concerning the draft permit may be obtained between the hours of 9 am and 5 pm, Monday through Friday from:

Mark Malone (CMP)
Municipal Permits Branch
U.S. EPA
One Congress Street - Suite 1100
Boston, MA 02114-2023
TEL. (617) 918-1619
FAX: (617) 918-2064
email: malone.mark@epa.gov

Paul Hogan
Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, MA 01608
TEL: (508) 767-2796
FAX: (508) 791-4131
paul.hogan@state.ma.us

Stephen S. Perkins, Director
Office of Ecosystem Protection
U.S. EPA